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Occupational Exposure to Electromagnetic Fields and Male Breast Cancer

A recent study published in the American Journal of Epidemiology suggests that men occupationally exposed to electromagnetic fields (EMFs) may experience an increased risk of breast cancer. Breast cancer in men is a very rare disease; about one case is diagnosed each year per 100,000 men in the general population. Electromagnetic fields are created by the flow of electrical charges in an alternating current and are generated by anything powered by electricity. Hair dryers, kitchen appliances, and electric power tools are examples of everyday sources of EMFs.

The researchers identified 227 men (cases) who were diagnosed with breast cancer between 1983 and 1987 from 10 population-based cancer registries. Three hundred men who did not have breast cancer and were similar in age served as the control population. Cases and controls were asked questions concerning their two longest-held occupations, the job titles, and the dates of employment. They were also asked questions about other factors known to be associated with male breast cancer, including a family history of breast cancer, exposure to ionizing radiation, head injuries, educational status, and body weight.

Each job title was categorized as "exposed" or "unexposed" according to the likelihood for exposure to electromagnetic fields. Jobs classified as "exposed" were divided into five subgroups: 1) electric trades and related occupations (telephone line and electric power installers), 2) electric equipment repair (telephone and household appliance repairers), 3) communications and broadcasting (air traffic controllers and broadcast equipment operators), 4) engineers and technicians, and
5) welders.

Thirty-three (14.5 percent) men with breast cancer and 26 controls (8.7 percent) held jobs that were classified as "exposed" to EMFs. Breast cancer cases were also more likely than the controls to have worked in four of the five subgroups considered. Cases were six times more likely than the controls to report that they worked in the electric trades and related occupations. The second highest risk, although not statistically significant, was for communication and broadcasting workers; cases were three times more likely to work in these jobs than the controls.

The risk of breast cancer did not increase with increasing duration of employment in "exposed" jobs. When the data were examined more closely, only individuals who were first employed before age 30 and worked in an "exposed" job for at least 30 years were at increased risk of developing breast cancer.

Care must be used when interpreting the results of this study because no actual measurements of EMF exposure were taken. The lack of exposure measurements and the variability with respect to exposure within each job category, limits any formal evaluation of male breast cancer risk in relation to the intensity of exposure. The authors advised that caution should be exercised in applying the results of this study to exposures in residential settings. The intensity of electric and magnetic field exposures has generally been found to be 10 times higher in occupational settings than in residential settings, and other aspects of exposure may differ even more.

Women and men share some similar risk factors for developing breast cancer, such as a family history of breast cancer and exposure to ionizing radiation. However, there is no certainty that this study has the same implications for women, and studies of occupational exposure to EMFs and the risk of breast cancer in women are needed. Compared to what we already know about the possible causes of male breast cancer, exposure to EMFs might only account for a very small fraction of the disease.

This Health Bulletin is one in a series of routine publications issued by the Office of Health to share data from health studies throughout the DOE complex. The authors' conclusions do not necessarily reflect those of the Department. For more information contact: Dr. Terry L. Thomas, Director, Health Coordination and Communication Division, Office of Epidemiology and Health Surveillance, U.S. Department of Energy, Washington, D.C. 20585; Telephone FTS 233-5328, Commercial (301) 353-5328.